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08/844879  
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HONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS  
WASHINGTON, D.C. 20231  
SIR:

Transmitted herewith for filing is the utility patent  
application of: **DAVID M. MORSE and FRANK FLETCHER**  
for: **DIRECTIONAL JUMPER CABLES**

Enclosed Are:

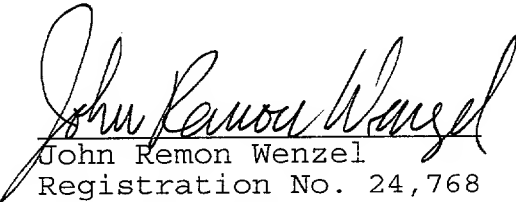
1. Patent Application, 16 sheets
2. 2 sheets of Formal Drawings Containing 3 Figures
3. Combined Declaration and Power of Attorney, 2 sheets
4. Verified Statement Claiming Small Entity Status, 1 sheet
5. Information Disclosure Statement
6. Associate Power of Attorney, 1 sheet
7. Form PTO-1449, with copies of 9 references
8. Filing Fee in the Amount of \$385.00

The filing fee has been calculated as shown below:

BASIC FEE	SMALL ENTITY	\$385.00
TOTAL CLAIMS	(6 - 20 = 0) x 11	0.00
IND. CLAIMS	(2 - 3 = 0) x 40	0.00
TOTAL		<u>\$385.00</u>

Additional fees due, if any, may be charged to Deposit Account  
No. 12-1662 of the undersigned.

Respectfully Submitted,

  
John Remon Wenzel  
Registration No. 24,768  
P.O. Box 15035,  
Crystal City Station  
Arlington, VA 22215-0035  
(703) 486-1000  
Attorney for Applicant

JRW

IN THE APPLICATION

OF

DAVID M. MORSE

AND

FRANK FLETCHER

FOR

DIRECTIONAL JUMPER CABLES

## DIRECTIONAL JUMPER CABLES

### CROSS REFERENCES TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Patent Application Serial No. 60/016,205 filed on April 22, 1996.

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### BACKGROUND OF THE INVENTION

#### 1. FIELD OF THE INVENTION

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The present invention is a set of jumper battery cables for providing power to a stranded vehicle battery from a rescue vehicle with a charged battery. The present invention prevents polarity reversal and damage to the electronic and computer circuitry of the rescue vehicle. More specifically, the present invention relates to battery cables with a half wave rectifier installed in the cable that connects the positive terminals of the stranded and rescue vehicle batteries. Further, indicia are located on the positive rescue cable clamp handle to indicate correct orientation of the half wave rectifier.

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#### 2. DESCRIPTION OF THE PRIOR ART

Numerous U.S. and foreign patents address the hazards and risks of incorrectly attaching jumper cables when trying to restart

a car with a dead battery, particularly the risk of explosion or short. A spark in proximity to exposed battery gases, or a short circuit can cause a catastrophic battery explosion, personal injury and property damage.

5           Nowadays however, the consumer is becoming more and more sophisticated and aware of these risks, and consequently what was once a certainty, is no longer so. The prior art solved a problem based on the assumption that vehicle owners did not know how to connect battery cables. This no longer the case; the information  
10 age has rendered the prior art obsolete. Media such as the Internet, television and radio programs, such as the National Public Radio show Car Talk®, has contributed to consumer education. Today it is unusual for a car owner not to know how to correctly jump start a car. Further combining this degree of consumer  
15 awareness with the fact that new jumper cables come with permanently affixed detailed instructions, the accidents that the prior art attempted to resolve, are now rare indeed.

          However, consumer education has not, nor has the current art, addressed the problem that the present invention solves: preventing  
20 destruction and damage to electronic and vehicle computer circuitry in the event of a reverse current flow when the battery cables are correctly attached between the stranded battery and the rescue battery.

          Furthermore, the present invention provides protection (i.e.,  
25 prevents cross polarity) even if the cables are incorrectly

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attached, meaning with the rectifier biased from the disabled vehicle rather than to the disabled vehicle.

Of particular interest to the present invention is U.S. Patent Number 4,831,321 issued to Robert Cooper on May 16, 1989, which describes a trickle jumping charging device. This device includes a polarity limiting diode in line with a current limiting resistor. The diode is specifically included to prevent damage to a recharging battery in the event a jumper cable is improperly connected (when a cable leads from a positive battery terminal to a negative terminal), thereby causing a reversal of polarity and a short. First, the Cooper patent teaches the use of a diode in conjunction, and in series, with a resistor. Second, the Cooper patent does not teach or describe that a diode alone can be utilized to prevent polarity reversal when battery cables are correctly attached. Conversely, the present invention not only utilizes a half wave rectifier without a resistor to prevent reverse current flow, but does so in a situation when a recharging battery is correctly connected, that is, when a cable connects both positive battery terminals.

Also of interest, U.S. Patent Number 4,463,402 issued to Gerald G. Cottrell on July 31, 1984, describes a safety jumper cable apparatus with a forward biased silicon controlled rectifier (SCR) connected to a gating circuit that includes a photoelectric triac; the photoelectric triac is triggered by a light emitting diode (LED). The LED is turned on only when the polarity is correct, i.e., the cables are correctly connected. The LED

triggers the photoelectric triac, thus causing a signal to turn on the SCR. Although this device does provide reverse polarity protection and short circuit protection, the present invention achieves similar results with fewer components and at greater cost savings.

Several patents describe jumper cables that include diodes as part of their circuitry; however, the circuitry described does not include a half wave rectifier that is in series with the positive terminals of batteries on rescue and stranded vehicles. For instance, U.S. Patent Number 4,163,134 issued to Charles R. Budrose on July 31, 1979, describes safety jumper cables that prevent possible sparking and the consequential risk of a battery explosion. This objective is accomplished with an on/off switch that is located on the cables at a safe distance from the batteries. Using this device, with the switch in the off position, the user first attaches the cables to the positive terminals. The switch, which is located away from any possible hydrogen source, is then turned on. The electronic circuitry provides for rectifiers that bridge the cables. None though, are in series on a single cable that connects the two positive battery terminals. The complexity of this device alone teaches away from the simple elegant solution that the present invention provides.

Similarly, U.S. Patent Number 4,238,722 issued to Jimmie R. Ford on December, 9, 1990, describes battery safety jumper cables with diodes used in connection with transistors and solenoids to provide a system that permits current flow only when the cables are

correctly attached. However, there are no diodes in series between positive terminals of rescue and stranded batteries that would prevent a reverse polarity. With similar functional limitations, U.S. Patent Number 4,740,740 issued to James Taranto et al. on April 26, 1988, also describes an apparatus and method for the automatic connection of battery cables. The complex circuitry of this device provides for proper cable polarity no matter how the cables are connected. However, no diodes are serially mounted on a jumper cable that connects the positive battery terminals. And again, U.S. Patent Number 5,230,637 issued to William P. Weber on July 27, 1993, describes a battery jumper cable with a circuit breaker with diodes connected to a lamp for indicating polarity. The circuitry as described does not provide for diodes to be serially mounted on a jumper cable that connects the positive battery terminals.

Further, British Patent Specification 1,270,799 published by Antony P. Royle and Reginald Ball on April 12, 1972, describes another device for insuring correct battery cable connections. In the event that the cables are correctly positioned, a diode permits the energizing of an electro-magnet which in turn closes a contact thus providing a complete circuit. As with previously mentioned patents, no diode is serially mounted on the jumper cable that connects the positive battery terminals.

Some devices utilize diode circuitry in devices that function only to indicate correct polarity. U.S. Patent Number 4,840,583 issued to Donald M. Moore on June 20, 1989, describes automatic

jumper cables which include a light emitting diode for indicating appropriate polarity, and as configured, provides no protection against polarity reversal or shorts.

Finally, British Patent Specification 959,762 published by Joseph A. Mas on June 3, 1964, describes an improved battery charger. Although diodes are used in the device, there are no diodes in any element considered analogous to battery cables. Thus, this reference is only indirectly pertinent to the present invention.

None of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed.

#### SUMMARY OF THE INVENTION

The present invention eliminates the need for costly and complex electronically configured jumper cables. Further, consumer awareness and instructive labeling has rendered the prior art obsolete. Battery cables no longer need to be made with intricate electronic circuitry to safeguard the uninformed consumer. Until the present invention, the art has not kept pace with changing needs. Specifically, the prior art does not offer an inexpensive and cost effective, easily repairable device that provides protection against reverse electrical current flow when battery cables are correctly attached. Also, the present invention provides protection (i.e., prevents cross polarity) even if the cables are incorrectly attached, meaning with the rectifier biased



from a disabled vehicle rather than to a disabled vehicle. This is a feature not taught or suggested in the prior art. Reverse current flow is likely in several situations. For example, as a vehicle operator attempts to start a stranded car with a faulty voltage regulator while jumper cables are attached to a rescue vehicle, an excess current can flow back to the positive terminal of the rescue vehicle battery. The unregulated current can destroy a rescue vehicle's computer circuitry.

In fact, nowadays automobiles are relying more and more on sophisticated computer circuitry, and damage is becoming frequent. The present invention is an inexpensive and elegantly simple device specifically configured to alleviate a major and heretofore unrecognized and unresolved problem of damage to a rescue vehicle's electronic circuitry from reverse electric flow when battery cables are correctly attached.

The present device is a pair of insulated 12 to 20 foot cables, each having clamp handles for attachment to battery terminals. Further, each cable has indicia for indicating whether the cable connects positive or negative terminals. Included in the positive cable is an industrial half wave rectifier biased such that when the cable is properly mounted a reverse electrical flow from a stranded vehicle battery is impossible. Upon one of the clamp handles of the positive cable is indicia for indicating the proper forward bias of the half wave rectifier. In the preferred embodiment of the invention, the half wave rectifier is located in one of the clamp handles of the positive cable. Further, the half

wave rectifier is of the snap-on type so that, in the event that the half wave rectifier is damaged, it can easily be replaced. The half wave rectifier is preferably an NTE® brand No. 6154, rated with a PRV 400v and IFV 150 amp., and having a surge rating of 2100 amps.

Accordingly, it is a principal object of the invention to provide a repairable set of battery cables that includes a half wave rectifier for preventing reverse current flow and consequential damage to a rescue vehicle's electronic and computer circuitry.

It is another object of the invention to provide a set of battery cables with a half wave rectifier with color coded cables for indicating a positive cable and a negative cable. Further, on the clamp handle of one of the positive cables are indicia for indicating the forward bias of the half wave rectifier.

It is a further object of the invention to provide a set of battery jumper cables in which the half wave rectifier is replaceable and located in a clamp handle of a positive cable.

Still it is another object of the invention to provide a set of battery jumper cables in which the replaceable half wave rectifier is rated PRV 400v and IFV 150 amp., and having a surge rating of 2100 amps.

It is an object of the invention to provide improved elements and arrangements thereof in an apparatus for the purposes described which is inexpensive, dependable and fully effective in accomplishing its intended purposes.

These and other objects of the present invention will become readily apparent upon further review of the following specification and drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

5           **FIG. 1** is a side view of the jumper cable device with a cut away view showing a diagram of the electronic circuit.

**FIG. 2** is a side elevation view of a clamp handle with a portion of the handle cutaway to reveal interior detail, so as to show the half wave rectifier circuitry placed within the handle.

10           **FIG. 3** is a perspective view of the jumper cables showing the proper bias of the positive cable with the half wave rectifier vis-a-vis the rescue vehicle battery.

          Similar reference characters denote corresponding features consistently throughout the attached drawings.

#### 15           DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

**Fig. 1** shows a battery jumper cable device 10 which has a pair of conductive cables 14, 16 which may be of stranded copper wire of 10 gauge for heavy duty high strength current carrying capacity. The cables 14, 16 are reasonably long, such as between approximately 12 and 20 feet. Each of these cables 14, 16 is suitably covered with a non-conductive insulating sheath or cover 18, and the two sheaths or covers 18 may be secured together throughout most of their length. A first cable 14 provides

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conduction of a positive charge and a second cable 16 provides conduction of a negative charge. The cable covers 18 are preferably color coded with a red positive cable covering and a black negative cable covering to assist the user in obtaining proper connections. Each cable end includes a conductively attached clamp handle 20, 22, 24, 26 for attaching the cables on battery terminals 44, 46, 48, 50 (shown in Fig. 3) of a rescue vehicle battery 40 and a stranded vehicle battery 42.

The cable 14 includes an electrical current restrictor in the form of a half wave rectifier for preventing reverse current flow while a user attempts to restart a stranded vehicle. The half wave rectifier 12 can be positioned within the positive conductive cable 14, as shown in Figs. 1 and 3. However, a preferable arrangement is shown in Fig. 2, where a replaceable snap type half wave rectifier 36 is positioned within the handle 38 of the positive clamp handle 20. The half wave rectifier is preferably an NTE® brand No. 6154, rated with a PRV 400v and IFV 150 amp., and having a surge rating of 2100 amps.

Upon each clamp handle are indicia for indicating whether the clamp handle should be attached to a positive battery terminal 46, 48 or to a negative battery terminal 44, 50. Preferably a "+" sign 28 is included on the positive clamp handles 20, 26, and a "-" sign 34 is included on the negative clamp handles 22, 24. On the clamp handle 20 of the positive cable 14, which is intended to be placed on the positive battery terminal, is indicia 30 for properly orienting the bias of the half wave rectifier. Preferably the

clamp handle 20 has the letters "rescue" 30 indicating that the clamp handle 20 should be placed on the positive terminal 48 of the battery 40 of the rescue vehicle.

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It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

## CLAIMS

We claim:

1. A directional automobile jumper cable device for connecting positive and negative battery terminals of a stranded vehicle battery and a rescue vehicle battery, comprising:

a first electrical conductive cable having a first and second end, and a second electrical conductive cable having a third and fourth end;

a first and second clamp handle means conductively affixed to said first and second ends for attaching said first cable to the positive battery terminals of the stranded vehicle battery and the rescue vehicle battery;

a third and fourth clamp handle means conductively affixed to said third and fourth ends of said second cable for attaching said second cable to the negative terminals of the stranded vehicle battery and the rescue vehicle battery; and,

said first cable having an electrical current restrictor means for preventing a positive electrical current flowing from the stranded vehicle battery to the rescue vehicle battery.

2. A directional automobile jumper cable device according to claim 1, wherein said electrical current restrictor is a half wave rectifier.

3. A directional automobile jumper cable device according to claim 2, wherein said half wave rectifier is a replaceable snap-in type half wave rectifier.

4. A directional automobile jumper cable device according to claim 3, wherein said half wave rectifier is housed in said first clamp handle means and said first clamp handle means includes indicia for properly orienting the bias of the half wave rectifier.

5. A directional automobile jumper cable device according to claim 1, wherein;

said first conductive cable has a non-conductive insulating red cover and said second conductive cable has a non-conductive insulating black cover.

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## ABSTRACT OF THE DISCLOSURE

A set of battery jumper cables for placing a discharged battery parallel with a charged battery in order to increase the amount of electrical energy available to the discharged battery. The battery jumper cables include a pair of conductor cables having at each end disengagable clamp handles for coupling terminals of the charged and discharged batteries. One of the conductor cables includes a half wave rectifier biased to permit an electrical charging current from the positive terminal of the charged battery, but prevent reverse flow and potential damage to automobile computer circuitry. In a preferred embodiment the half wave rectifier is replaceably included in one of the disengagable clamp handles of one of the conductor cables. Alternative embodiments include color coding the conductor cables. Other embodiments also include indicia on a clamp handle indicating the bias of the half wave rectifier.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE APPLICATION OF:

APPLICANT : David M. MORSE and Frank FLETCHER  
SERIAL NO. : Unassigned ART UNIT: Unassigned  
FILED : Herewith EXAMINER: Unassigned  
FOR : DIRECTIONAL JUMPER CABLES

THE HONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS

WASHINGTON, DC 20231

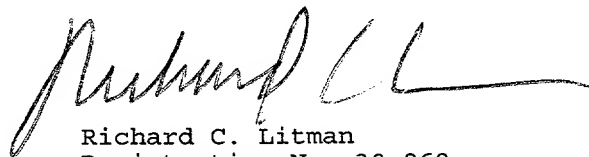
Sir:

INFORMATION DISCLOSURE STATEMENT  
35 U.S.C. 6; 37 C.F.R. 1.97; 1.98

Submitted herewith are copies of prior art domestic patents, foreign patents and/or publications identified and discussed in the specification of the above identified application under the heading: "DESCRIPTION OF THE PRIOR ART." These are identified on the attached PTO-1449 form.

The discussion of these prior art patents and/or publications in the attached specification is believed to satisfy the duty to disclose requirements as set forth in the above identified statute and rules.

Respectfully submitted,



Richard C. Litman  
Registration No. 30,868  
(703) 486-1000

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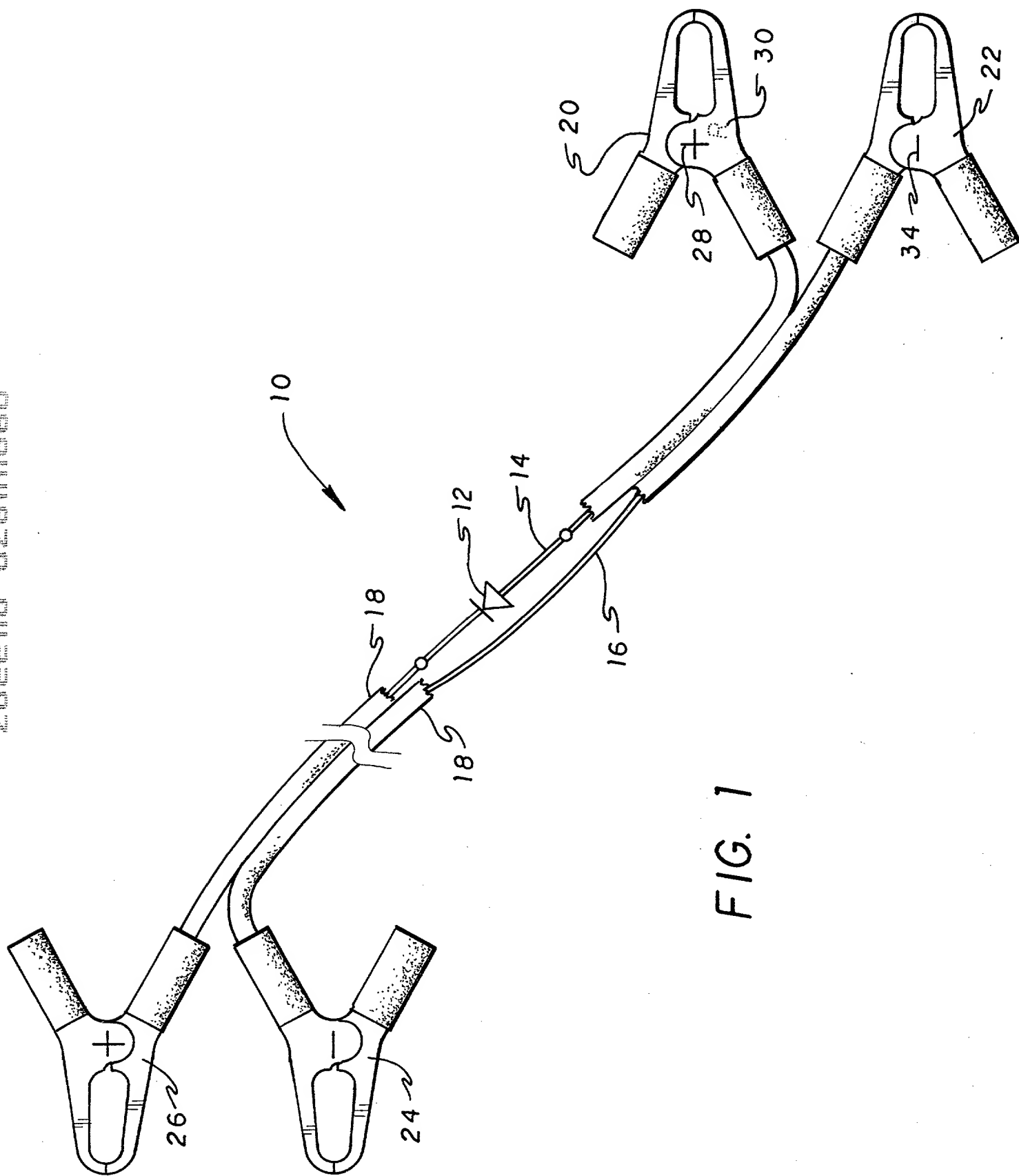
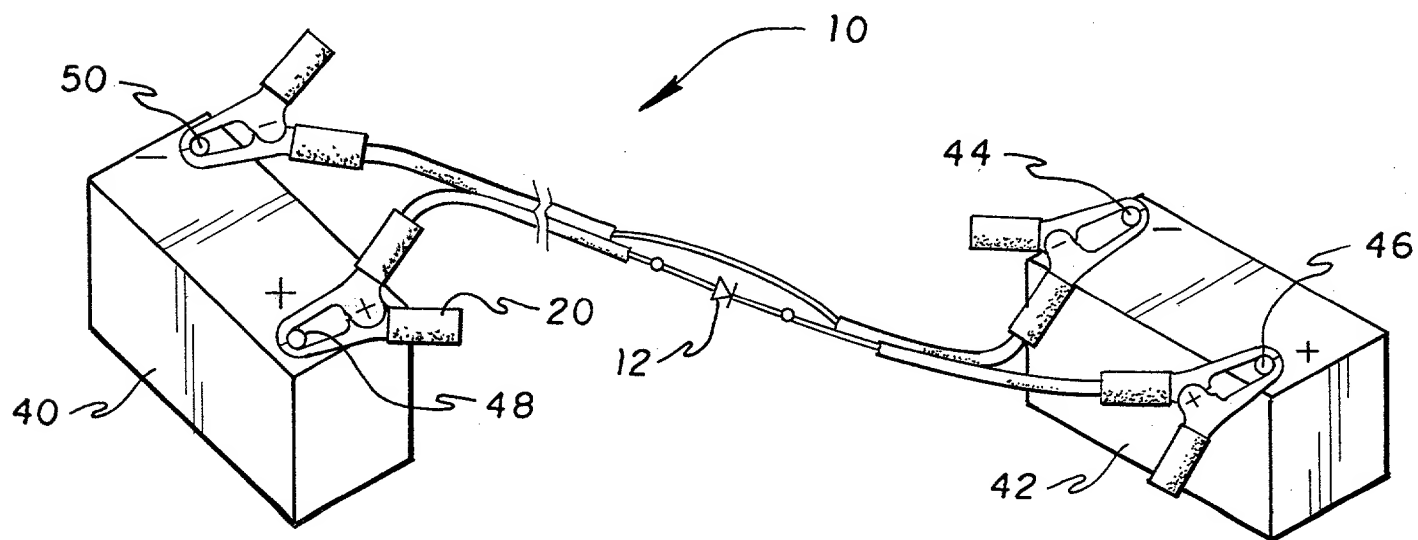
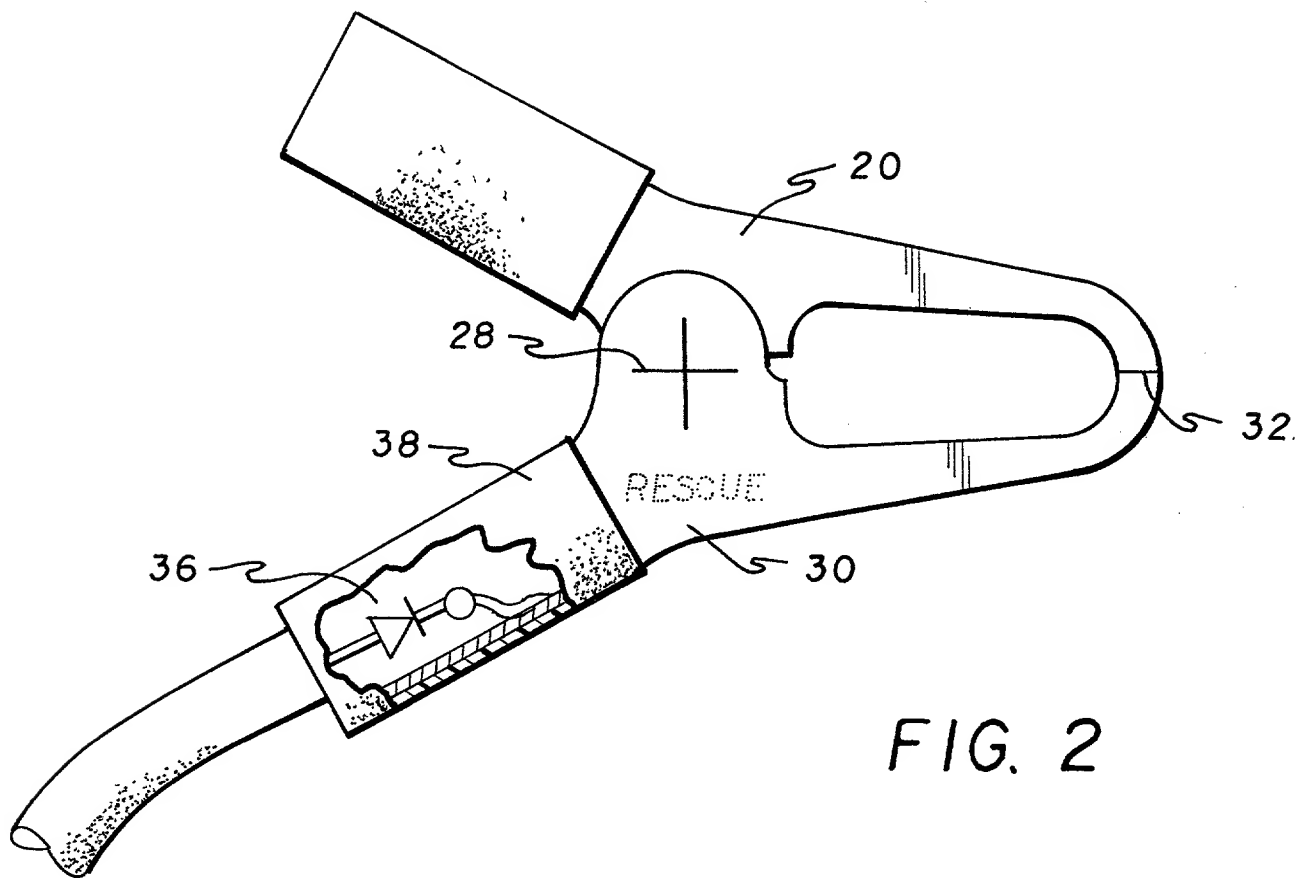


FIG. 1



COMBINED DECLARATION AND POWER OF ATTORNEY

As the below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

DIRECTIONAL JUMPER CABLES

the specification of which is attached hereto unless the following box is checked:

☐ was filed on \_\_\_\_\_ as United States Application Serial Number \_\_\_\_\_ or PCT International Application Number \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificates, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)

☐  
☐

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

<u>60/016,205</u> (Application Number)	<u>April 22, 1996</u> (Filing Date)
_____ (Application Number)	_____ (Filing Date)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112.

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I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Number)	(Filing Date)	(Status -- patented, pending, abandoned)
(Application Number)	(Filing Date)	(Status -- patented, pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Richard C. Litman: Registration No. 30,868  
Direct all telephone calls to: Richard C. Litman  
(703) 486-1000  
Address all correspondence to: Richard C. Litman  
LITMAN LAW OFFICES, LTD.  
P.O. Box 15035  
Arlington, VA 22215

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of First Inventor: David M. Morse

Signature: David M. Morse

Date: 4-18-97 Country of Citizenship: U.S.A.

Residence: 9349 S. State Road 129  
Cross Plains, IN 47017

Post Office Address: Same

Full Name of Second Inventor: Frank Fletcher

Signature: Frank Fletcher

Date: 4/18/97 Country of Citizenship: U.S.A.

Residence: 38730 Lexington #296  
Fremont, CA 94536

Post Office Address: Same

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS  
(37 CFR 1.9(f) and 1.27(b))--INDEPENDENT INVENTOR**

As the below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9 (c) for purposes of paying reduced fees under section 41 (a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled below and in:

**DIRECTIONAL JUMPER CABLES**

  X   the specification filed herewith.

I have not assigned, granted, conveyed, or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9 (c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9 (d) or a nonprofit organization under 37 CFR 1.9 (e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

  X   no such person, concern or organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small business entity is no longer appropriate. (37 CFR 1.28 (b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

David M. Morse  
Name of First Inventor

David M. Morse  
Signature of First Inventor

Date 4-18-97

Frank Fletcher  
Name of Second Inventor

[Signature]  
Signature of Second Inventor

Date 4/18/97

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE APPLICATION OF:

APPLICANT : David M. MORSE and Frank FLETCHER  
SERIAL NO. : Unassigned ART UNIT: Unassigned  
FILED : Herewith EXAMINER: Unassigned  
FOR : DIRECTIONAL JUMPER CABLES

THE HONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS  
WASHINGTON, DC 20231  
Sir:

ASSOCIATE POWER OF ATTORNEY AND APPOINTMENT OF AGENTS  
37 C.F.R. 1.34(b)

Please recognize as Associate Attorneys in this case:

John Remon Wenzel	Reg. No. 24,768
Charles K. Friedman	Reg. No. 39,195
Edwin V. Merkel	Reg. No. 40,087
Leonid D. Thenor	Reg. No. 39,397

Please recognize as Associate Agents in this case:

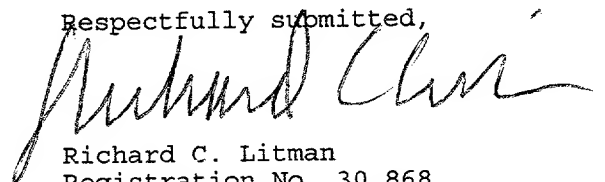
Dolph H. Torrence	Reg. No. 34,501
George T. Ozaki	Reg. No. 33,081
Carl L. Benson	Reg. No. 38,378
Warren S. Edmonds	Reg. No. 39,642
Donald E. Watkins	Reg. No. 37,074
Christopher D. Ward	Reg. No. P-41,367

The addresses and phone numbers of the above Attorneys and Agents are the same as that of the undersigned Principal Attorney.

All previous Associate Powers are hereby revoked.

Please address all correspondence in this application to the undersigned Principal Attorney.

Respectfully submitted,



Richard C. Litman  
Registration No. 30,868  
LITMAN LAW OFFICES, LTD.  
P.O. Box 15035  
Arlington, VA 22215  
(703) 486-1000

RCL:tcs